

## REMARKS

Claims 1-23 are pending in this application. Claims 1-21 are rejected. Claims 22 and 23 are objected to. Claims 1, 12-14, 21-23 are hereby amended. Claims 22-43 are hereby added. Support for the amendments to claim 1 (applying isoflavones "to the surface of at least part of a plant") is found in the first full paragraph on page 15 of the application. Claim 12 has been rewritten as an independent claim that incorporates claim 1. Support for additional amendments to claim 12 (recitation of enhancing release of isoflavones from sugar conjugate and enhancing incorporation of aglycones into glyceollin) and to claim 21 is found in the first full paragraph on page 14 of the application. Additional amendments to claim 21 are for clarity. As suggested by the Examiner, the method claims 22 and 23 are amended to composition claims. Support for new claims 24-26, 30-33, 35-37, and 39-42 is found in the first full paragraph on page 14 of the application. Support for new claims 27-29, 38 and 43 is found on pages 9, 10, 12 and 14 of the application. Support for new claim 34 is found in original claim 19. The amendments and new claims add no new matter.

In response to the election requirement, applicants provisionally elect species drawn to a compound of formula I plus orthovanadate. The claims readable thereon are original generic claims 15-20; amended generic claims 12, 13, 21 and 22; new generic claims 24, 29, 30, 34, 35, 38 and 39; and new species claims 25, 31, 36, 40 and 43. This response is without traverse.

Reconsideration of the rejections and allowance of the claims in view of the above amendments and following remarks is respectfully requested.

### Claim Objections

Claims 22 and 23 are objected to as being of improper dependent form. Dependent claims 22 and 23 have been rewritten as claims to a composition of matter so they correctly depend from claim 21, which is also a composition claim. It is submitted that the amendments overcome the objections.

### Claim Rejections - Rule § 112

Claims 1-20 are rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps. Claim 1 has been amended to indicate that the composition is

applied “to the surface of at least part of a plant capable of producing an isoflavone.” Claims 2-11 and 15-20 depend from claim 1 and, therefore, have not been amended. New claim 12 recites the same language. Claims 13 and 14 depend from amended claim 12 and, therefore, have not been amended. The amendment adds no new matter. It is submitted that the amendment overcomes the rejection.

Claim 21 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. The Patent Office has not provided more specific information as to why this claim is indefinite. However, Applicants have amended claim 21 for clarity, specifically to more clearly state that the claimed composition comprises a nuclear receptor ligand and compounds that (i) enhance the release of isoflavones from a sugar concentrate in a plant or seed, or (ii) enhance the incorporation of aglycones in a plant or seed into a glyceollin, or (iii) both. The amendment adds no new matter. It is submitted that the amendment overcomes the rejection.

#### Claim Rejections - Rule § 102(b)

Claim 21 is rejected under 35 U.S.C. § 102(b), as being anticipated by Clark (U.S. Pat. No. 4,945,089; issue date July 31, 1990) (hereinafter “Clark”).

Claim 21, as amended, recites a composition for inducing disease resistance in plants. As recited in amended claim 21, the composition comprises one or more steroids having a structure shown in the claim (structure I). Moreover, as recited in amended claim 21, the composition further comprises a compound which (i) enhances the release of isoflavones from a sugar conjugate in the plant or seed, (ii) enhances incorporation of aglycones in the plant or seed into glyceollin, or (iii) enhances release of isoflavones from a sugar conjugate in the plant or seed and incorporation of aglycones in the plant or seed into glyceollin.

Clark does not disclose a composition which comprises both a steroid having structure I and a compound that enhances incorporation of aglycones into glyceollin in a plant or seed, as recited in amended claim 1. Indeed, nowhere in Clark is there any mention of compositions that alter the levels of compounds found in plants and seeds. Lacking such disclosures, Clark does not anticipate claim 21.

In view of the above-described amendments and remarks it is submitted that original claims 2-11, and 15-20, amended claims 1, 12-14, and 21-23, and new claims 24-43 are now in condition for allowance. Prompt notice of such allowance is respectfully requested.

Dated: June 20, 2002

Respectfully submitted,

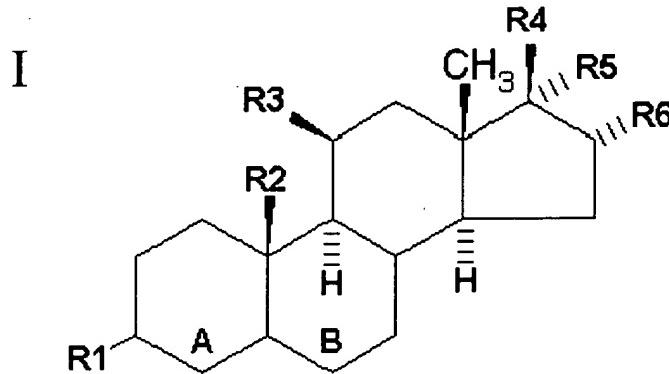
Pamela A. Docherty  
Pamela A. Docherty, Reg. No. 40,561

**Version with Markings to Show Changes Made**

**IN THE CLAIMS**

1. (Amended) A method of inducing production of isoflavones in a plant comprising:  
a) applying to the surface of at least part of a plant capable of producing an isoflavone, a biologically effective amount of a composition comprising a nuclear receptor ligand selected from the group consisting of:

(1) a steroid having structure I or structure II as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH<sub>3</sub>,

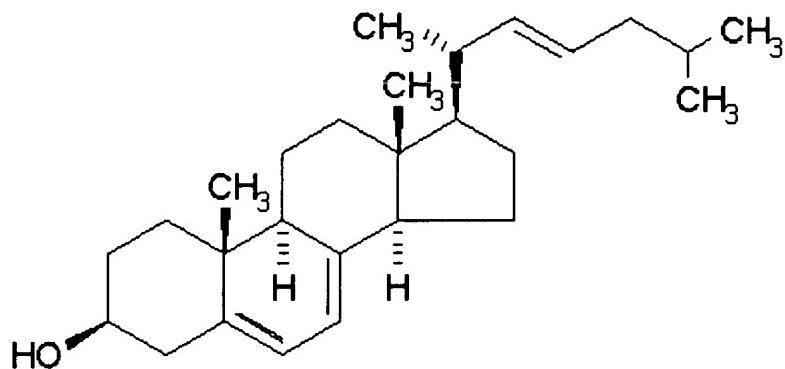
R3 = O, OH, or H,

R4 = O, OH, H, CO<sub>2</sub>H, C(O)CH<sub>2</sub>OH, or C(O)CH<sub>3</sub>,

R5 = OH or H, and

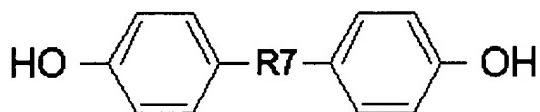
R6 = CH<sub>3</sub>, OH or H;

II



- (2) a phenolic compound, wherein the phenolic compound is a phenolic estrogen or a diphenyl having structure III as below,

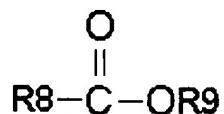
III



Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

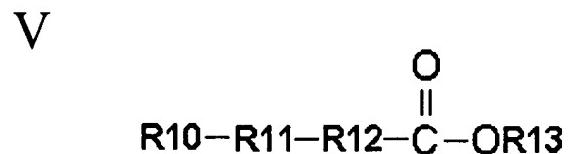
- (3) a long chain fatty acid having structure IV below,

IV



Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

(4) a peroxisome proliferator having structure V below,



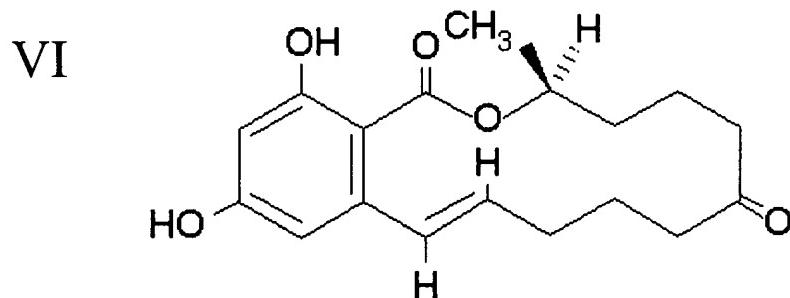
Wherein R10 is an aromatic ring or rings,

R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

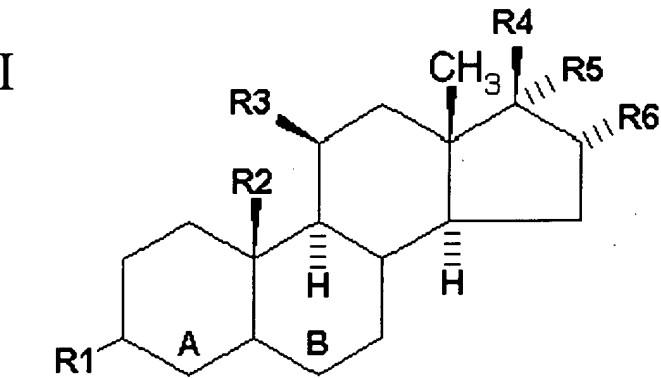
(5) the fungal steroid zearalenone, having structure VI below,



12. (Amended) [The]A method of [claim 1 wherein the composition further comprises a compound which enhances the activity of the nuclear receptor ligand.]inducing disease resistance in a plant comprising applying to the surface of at least part of a plant capable of producing an isoflavone, a biologically effective amount of a composition comprising:

a) a nuclear receptor ligand selected from the group consisting of:

(1) a steroid having structure I or structure II as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH3,

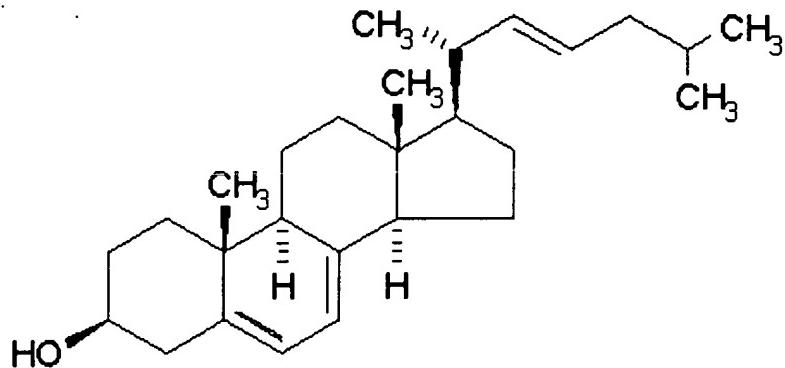
R3 = O, OH, or H,

R4 = O, OH, H, CO2H, C(O)CH2OH, or C(O)CH3,

R5 = OH or H, and

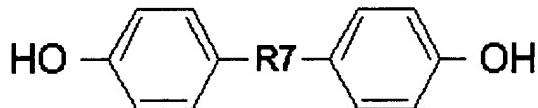
R6 = CH3, OH or H;

II



(2) a phenolic compound, wherein the phenolic compound is a phenolic estrogen or a diphenyl having structure III as below,

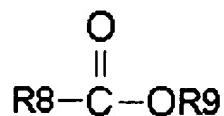
III



Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

(3) a long chain fatty acid having structure IV below,

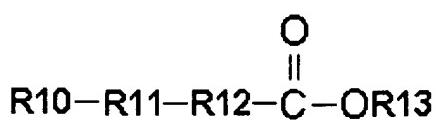
IV



Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

(4) a peroxisome proliferator having structure V below,

V



Wherein R10 is an aromatic ring or rings,

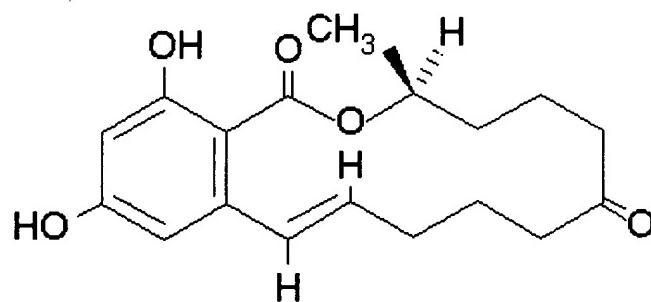
R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

(5) the fungal steroid zearalenone, having structure VI below,

VI



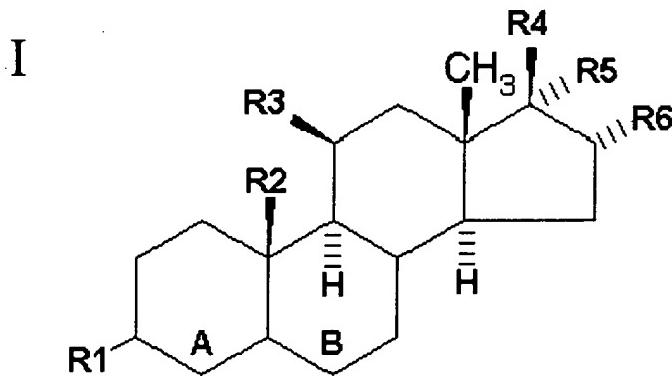
and

b) one or more compounds that enhance the release of isoflavones from a sugar conjugate, enhance the incorporation of aglycones into glyceollin, or enhance the release of isoflavones from a sugar conjugate and incorporation of aglycones into glyceollin.

21. (Amended) A composition for [enhancing levels of isoflavones] inducing disease resistance in a plant or seed, comprising:

(a) one or more nuclear receptor ligands, [and one or more compounds which enhance the activity of the nuclear receptor ligand;] wherein said nuclear receptor ligands are selected from the group consisting of

(1) a steroid having structure I or structure II as below,



Wherein rings A, B have the same or different degrees of saturation,  
wherein

R1 = OH or O,

R2 = H or CH<sub>3</sub>,

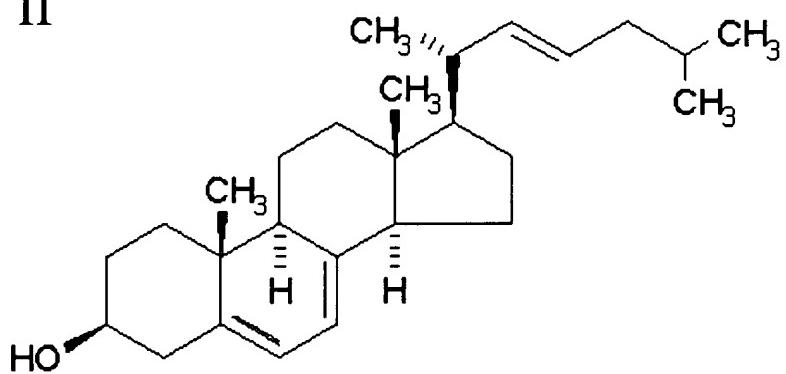
R3 = O, OH, or H,

R4 = O, OH, H or CO<sub>2</sub>H, C(O)CH<sub>2</sub>OH or C(O)CH<sub>3</sub>

R5 = OH or H, and

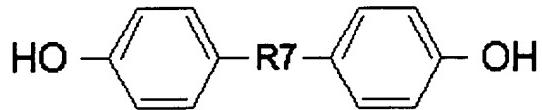
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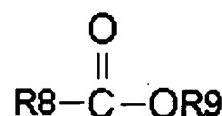
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Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

(3) a long chain fatty acid having structure IV below,

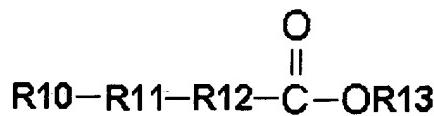
IV



Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

(4) a peroxisome proliferator having structure V below,

V



Wherein R10 is an aromatic ring or rings,

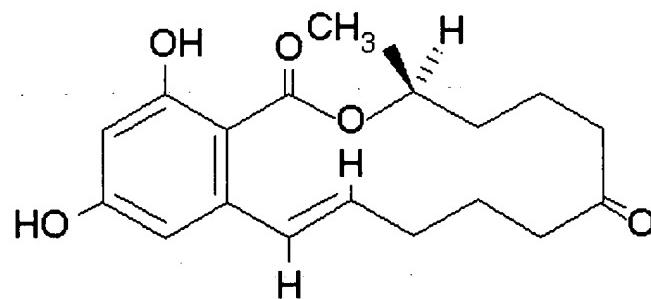
R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

(5) the fungal steroid zearalenone, having structure VI below,

VI



and

(b) one or more enhancing compounds which enhance the release of isoflavones from a sugar conjugate in the plant or seed, enhance incorporation of aglycones in the plant or seed into glyceollin, or enhance release of isoflavones from a sugar conjugate in the plant or seed and incorporation of aglycones in the plant or seed into glyceollin.

22. (Amended) The composition[method] of claim 21 wherein the enhancing compound is orthovanadate, rose bengal, or a tetrazolium redox dye.

23. (Amended) The composition[method] of claim 21 wherein the enhancing compound is a copper salt or a fragment of the naturally occurring cell wall glucan from the pathogen *Phytophthora sojae*.